CLAIMS

What is claimed is:

1.   A stimulation output switching system for a multi-channel stimulator, said system comprising:

N number of DACs (11);

M number of electrode contacts (31); and

N x M number of switches (21);

wherein each DAC (11) of the N number of DACs is coupled uniquely to one group (50) of M number of switches (21), each switch within each group (50) of M switches, in turn, is coupled to each one of M electrode contacts (31); and

wherein M and N are whole numbers and M is greater than N.

2.   The system of claim 1 wherein the switches are transistor switches.

3.   The system of claim 2 wherein the transistor switches are selected from the group consisting of PMOS or MOS transistors.

4.   The system of claim 1 wherein the switches are programmable using software or hardware programming.

5.   The system of claim 4, wherein the programming allows one and only one switch (21), at any one time, to be electrically closed (connected) to one particular electrode contact (31), and thereby permit current to flow through that single electrode contact.

6.   A stimulation output switching system for a multi-channel stimulator, said system comprising:

N number of DACs (12);

M number of switches (121), grouped into N grouped sets (110) of switches, each set (110) having L number of switches (121);

M number of electrode contacts (130); and

L number of electrode contact groups (100),

wherein each DAC (12) of the N number of DACs is coupled to one of the N grouped sets (110) of switches (121);

wherein each switch (121) in one of the N set (110) of switches, in turn, is uniquely coupled to only one electrode contact (130) in each of L groups (100) of electrode contacts;

wherein the whole numbers N, L and M are chosen such that, $N \times L = M$; and

wherein M is greater than N.

7.   The system of claim 6 wherein the switches are transistor switches.

8.   The system of claim 7 wherein the transistor switches are selected from the group consisting of PMOS or MOS transistors.

9.   The system of claim 6 wherein the switches are programmable using software or hardware programming.

10.   The system of claim 9 wherein the programming allows electrode contacts (130) only one electrode contact group (100) or, a subset thereof, among the L contact groups (100) to pass current in a single time duration T_d.

11.   A method of switching outputs in a multi-channel stimulator, said method comprising:

(a) providing N number of DACs (11);

(b) providing M number of electrode contacts (31);

(c) coupling each of N DACs (11) to a group of M switches (31);

(d) coupling each of the M switches (31) uniquely to each of M electrode contacts (31); and

(e) connecting selected switches (21) by closing the switches, to electrically connect selected electrode contacts (31) to transmit current, while avoiding closing more than one switch (21) connected to the same electrode contact (31) at any one time,

wherein there is at least N x M total number of switches (31); and

wherein M and N are whole numbers and M is greater than N.

12.   The method of claim 11 wherein the switches are transistor switches.

13.   The method of claim 12 wherein the transistor switches are selected from the group consisting of PMOS or MOS transistors.

14.   The method of claim 11 wherein the step (e) of connecting switches is accomplished by using software or hardware programming.

15.   A method of switching outputs in a multi-channel stimulator, said method comprising:

(a) providing N number of DACs (12);

(b) providing M number of electrode contacts (130) and M number of switches (110);

(c) coupling each of N DACs (12) to at least one set (110) of switches having L number of switches (121) in the at least one set (110);

(d) coupling each switch (121) within the at least one set (110) of switches, uniquely to one of the M electrode contacts (130); and

(e) causing current to flow through selected electrode contacts (130) at any one time duration, T_d, by closing the associated switches (121),

wherein the whole numbers N, L and M are chosen such that $M = N \times L$, and M is greater than N.

16. The method of claim 15 wherein the switches are transistor switches.

17. The method of claim 16 wherein the transistor switches are selected from the group consisting of PMOS or MOS transistors.

18. The method of claim 15 wherein the switches are software programmable.

19. The method of claim 15 wherein the step (e) of causing current to flow through a selected group of electrode contacts is accomplished by causing current to flow in only one of L number of electrode contact groups (100) at any one time duration, T_d.